

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

In the Matter of)

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The Development of Operational,)
Technical, and Spectrum Requirements)
for Meeting Federal, State and Local)
Public Safety Communication)
Requirements Through the Year 2010)

WT Docket No. 96-86

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REPLY COMMENTS OF
ERICSSON INC.

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SUMMARY

In the Notice of Proposed Rulemaking in WT Docket No. 96-86, the Commission raised issues the resolution of which will have a profound effect on the public safety community and, hence, on the future safety of life and property for all Americans. Ericsson Inc., as a major participant in the wireless communications marketplace and a major supplier of public safety land mobile radio equipment and systems, submitted comments in response to the Commission's Notice. Since that time, Ericsson has reviewed the comments filed by other participants in the proceeding and is now pleased to submit the attached reply comments based on that review.

As a threshold matter, we note the overwhelming agreement among the commenting parties of the importance of effective and efficient public safety wireless communications to the safety of life and property and to law enforcement more generally. We also note the overwhelming support for the conclusions reached in the Public Safety Wireless Advisory Committee Final Report as to the current and future spectrum needs of public safety agencies.

Having participated heavily in the PSWAC process and having reviewed the comments filed by other parties in the instant proceeding, Ericsson believes that the most important and, in certain respects, most contentious issues fall into three categories: spectrum requirements/efficiency, interoperability, and competition in the provision of public safety systems/equipment. Hence, in the attached reply comments Ericsson focused its attention in these three areas.

Based on our review of the comments in the first round of the proceeding and the analysis and arguments put forth herein, we respectfully suggest that the Commission should take the following actions to resolve the principal issues raised in this proceeding:

First, the Commission should (a) take immediate steps to reallocate portions of the upper region of the UHF television band and make it available to meet some of the more pressing needs of the public safety community and (b) give serious consideration to modifying the core channel concept in the DTV proceeding to allow public safety users to gain access to spectrum in the desirable VHF and lower UHF regions of the spectrum.

Second, the Commission should also accelerate the shift to 6.25 kHz equivalent channel spacing by the year 1999 to ensure that public safety spectrum requirements can be met within the amount of spectrum forecast by the PSWAC.

Third, the Commission should adopt a suite of incentives for public safety agencies to adopt more spectrum efficient technologies as soon as possible, especially in major urban areas where spectrum congestion is most prevalent. Such incentives are needed given the special environment in which public safety wireless communications operates.

Fourth, the Commission should adopt rules to establish 25 kHz analog FM (migrating to 12.5 kHz) as the common mode of communications on the interoperability channels. This would allow the proponents of various technological solutions, including more spectrum efficient systems, to offer their systems/equipment in a competitive market while meeting legitimate concerns about interoperability.

Fifth, recognizing the concentrated nature of the market and the influence of the dominant supplier in that market over the standards-setting process, the Commission should adopt a rule that would preclude a public safety agency from specifying any technical standard (such as the

Phase I APCO Project 25 specification) *as a condition of any procurement* that would involve the use of spectrum allocated to public safety purposes.

Sixth, the Commission should establish such rules and regulations as may be necessary to ensure that any future effort to establish a baseline technology be conducted by an accredited standards-setting organization or, if a non-accredited standards-setting organization attempts to promulgate such standards, to ensure that it follows and complies with the principles set forth in Section 273(d)(4) of the 1934 Communications Act (as amended). Such rules and regulations should (a) embody the four principles of Openness, Lack of Dominance, Consideration of Views and Objections and an Appeals Process that must guide all standards-setting bodies and (b) include such rules and regulations as may be necessary to ensure compliance.

By taking these six steps, the Commission will be taking important steps in the direction of relieving the present deficiencies in public safety wireless communications while creating a regulatory environment which fosters competition and the development and deployment of more technologically advanced (including more spectrum efficient) systems/equipment in the public safety market.

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**REPLY COMMENTS OF
ERICSSON INC.**

I. INTRODUCTION

In the Notice of Proposed Rulemaking in the above captioned docket,¹ the Federal Communications Commission ("Commission") raised issues the resolution of which will have a profound effect on the public safety community and, hence, on the future safety of life and property for all Americans. Ericsson Inc. ("Ericsson"), with nearly 7,000 employees in the United States, is a major participant in the wireless communications marketplace and, in particular, through its Private Radio Systems operation in Lynchburg, Virginia, it is a major supplier of public safety land mobile radio equipment and systems. As a major provider of wireless equipment and systems, and recognizing the importance of effective and efficient public safety wireless communications to the safety of life and property and to law enforcement more generally,

¹ The Development of Operational, Technical, and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010, WT Docket No. 96-86, FCC 96-155, released April 10, 1996 ("Notice").

Ericsson, on October 21, 1996, submitted comments ("comments") in response to the Commission's Notice. Since that time, Ericsson has reviewed the comments filed by other participants in the proceeding and is now pleased to submit these reply comments based on that review.

In its Notice, the Commission raised a myriad of issues relating to the future of public safety wireless communications, and the pleadings filed in the comment round of the proceeding not only respond to those issues, but raise others as well. As a threshold matter, however, we note the overwhelming agreement among the commenting parties of the importance of effective and efficient public safety wireless communications to the safety of life and property and to law enforcement more generally. We also note the overwhelming support for the conclusions reached in the Public Safety Wireless Advisory Committee ("PSWAC") Final Report as to the current and future spectrum needs of public safety agencies.

Having participated heavily in the PSWAC process and having reviewed the comments filed by other parties in the instant proceeding, Ericsson believes that the most important and, in certain respects, most contentious issues fall into three categories: spectrum requirements/efficiency, interoperability, and competition in the provision of public safety systems/equipment. Hence, in these reply comments Ericsson will focus its attention in these three areas.

II. ISSUES RELATING TO SPECTRUM REQUIREMENTS AND SPECTRUM EFFICIENCY

A. Spectrum Requirements

As noted above, the comments provide strong support for the approach used by the PSWAC in forecasting future spectrum needs and its conclusions regarding the current and future spectrum requirements of public safety agencies. Thus, we believe that the record in the comment round provides clear justification for the reallocation of almost 100 MHz of additional spectrum for public safety wireless communications by the year 2010. There is less clarity in two related areas -- namely, in terms of spectrum efficiency and the source of the new spectrum.

B. Spectrum Efficiency

With regard to spectrum efficiency, in our comments we expressed concern that the PSWAC assessment of future spectrum needs is inconsistent with the rate at which the public safety market can and will adopt more spectrum efficient technology under the Commission's current rules.² We went on to state our belief that the spectrum efficiency assumed in the PSWAC analysis can only be achieved by the public safety community if the FCC accelerates the shift to 6.25 kHz equivalent channel spacing. In support of this position, we attached an appendix to our Comments in which we described the analysis that led us to that conclusion. Based on our review of the other first round comments, we were unable to locate anyone else who conducted a similar analysis. However, there was substantial support for the proposition that the Commission should expedite the adoption of more spectrum efficient systems and to create other incentives for the migration to spectrum efficient systems. For example, APCO states that "The [refarming]

² Comments of Ericsson Inc., dated October 21, 1996, at pp. 30-31.

process should be expedited to some degree by specifying dates certain by which conversion to the narrower channels would be required under penalty of reverting the license to secondary status.”³ Similarly, NTT states that “...the Commission should establish spectrum efficiency standards to ensure that, within a time frame that permits current spectrum users to amortize their existing equipment, all users will ultimately use spectrum-efficient equipment.”⁴ Thus Ericsson reiterates its recommendation that the Commission accelerate the shift to 6.25 kHz equivalent channel spacing by the year 1999 and take other steps to encourage increased spectrum efficiency in public safety wireless communications.⁵

In our analysis of the regulatory options available to the Commission, we noted that, conceptually, increased spectrum efficiency in public safety mobile radio systems can be promoted in two ways -- through creating positive incentives (or eliminating regulatory disincentives) for the use of more spectrum-efficient systems, or by creating disincentives for use of spectrum-inefficient systems. As indicated above, our review of the pleadings in the comment round revealed substantial support for regulatory incentives to encourage adoption of more spectrum-efficient systems in general as well as support for incentives to encourage the introduction of specific techniques such as joint/shared systems and trunking.

³ Comments of Association of Public-Safety Communications Officials-International, Inc. (“APCO”), dated October 21, 1996 at p. 17.

⁴ Comments of Nippon Telegraph and Telephone Corporation (“NTT”) dated October 21, 1996, at p. 4.

⁵ Ericsson Comments at pp. 30-31.

For example, NYCT notes that "Regulatory incentives to promote efficient technology implementation may include priority access to spectrum licensing/assignment and receipt of funding through auction proceeds."⁶ IMSA/IAFC notes that "...the Commission could offer public safety users who agree to conform to certain equipment or technological requirements exclusive use of their assigned channels."⁷ NTT states that it believes "the Commission should provide incentives to encourage as expeditious a transition to the most spectrum-efficient technology available as is practical, given the budgetary constraints that confront public safety licensees."⁸ Later in its pleading, NTT puts forth a number of suggestions for such incentives including offering exclusivity and allowing users converting to a more spectrum-efficient system to lease excess capacity or to retain a percentage of the "new" channels created by the conversion. Based on our review of the comments, Ericsson remains convinced that exclusivity is an important "carrot" to encourage the use of more spectrum-efficient technology by public safety agencies.⁹ Thus we urge the Commission to adopt appropriate rules to grant exclusivity when agencies voluntarily adopt more spectrum efficient technologies and to give careful considerations to the other incentives proposed.

⁶ Comments of New York City Transit ("NYCT") dated October 17, 1996 at p. 10.

⁷ Comments of the International Municipal Signal Association and the International Association of Fire Chiefs, Inc. ("IMSA/IAFC") dated October 21, 1996, at p. 20.

⁸ NTT Comments at p. 4.

⁹ We are aware that, historically, public safety agencies have operated in an environment of "*de facto* exclusivity" as a result of the frequency coordination process. Nevertheless, even the theoretical possibility of interference from increased sharing (especially as spectrum demand increases) may deter users from committing to invest in more advanced, spectrum efficient technologies. See the discussion summarizing the Transition Subcommittee's findings and recommendations at page 62 (paragraph 4.5.3) of the PSWAC Final Report.

In our comments, we set forth what we believed to be convincing arguments for the advantages of joint/shared systems and trunking not only in terms of spectrum efficiency, but also in terms of enhanced interoperability and other benefits. While some parties noted that joint/shared systems and trunking (either together or separately) may not be the best solution in all cases, there was strong overall support for these techniques for improving spectrum efficiency. With specific reference to sharing, for example, Powell argues that while the final decision should be left to the individual licensee, "...the FCC can and should certainly consider incentives to construct [joint] networks."¹⁰ Commenting on shared systems, the State of Ohio states:

Placing a "requirement" to share might have an adverse effect, however, inducements or incentives could be offered to those who do want to share. Such things as accelerating the licensing process or easing the channel loading requirements are initial thoughts.¹¹

AASHTO states that:

One action the Commission could take to encourage sharing is to establish loading standards for all applicants. This could force multiple public safety agencies to share systems in order to meet the minimum loading levels per channel.¹²

With specific respect to trunking, APCO notes that "...trunking a large system with a mix of services with different busy hours of operation can offer significant improvement in spectrum efficiency."¹³ The State of Ohio, which has done extensive analysis in conjunction with a major

¹⁰ Comments of John S. Powell ("Powell") undated, at p. 16.

¹¹ Comments of the State of Ohio, Department of Administrative Services ("State of Ohio") undated at para. 72(c).

¹² Comments of the American Association of State Highway and Transportation Officials ("AASHTO") dated October 10, 1996 at pp. 15-16.

¹³ APCO Comments at p. 17.

statewide system, states that "We have no doubt that trunking increases spectrum efficiency."¹⁴ Mesa states that "We believe it would be helpful for the Commission to give some form of licensing incentives for the use of trunking."¹⁵ AASHTO states that "Trunking along with spectrum efficient modulation techniques will facilitate sharing by making systems operate more efficiently."¹⁶

Ericsson, in its comments, clearly stated that it agrees that it would be inappropriate and counter-productive for the Commission to dictate any particular technologies or set of technologies for use on public safety frequencies. Hence we find ourselves in agreement with most, if not all, of the parties who argued against such regulations in their comments. However, as we stated in our comments, because the minimum standard of spectrum efficiency (i.e., 6.25 kHz equivalent channels) does not include the positive effects of trunking, and because rapid technological changes could, conceivably, make even a 4:1 improvement obsolete, Ericsson urges the Commission to adopt our recommendation to prohibit a public safety agency from *a priori* preventing a potential provider of public safety systems from proposing a more spectrum efficient technology.¹⁷ In that way, the rules will never be in the way of new technologies.

C. Source of the New Spectrum

¹⁴ State of Ohio Comments at para. 65.

¹⁵ Comments of the City of Mesa, Arizona Communications Division ("Mesa") dated October 18, 1996 at p. 16.

¹⁶ AASHTO Comments at p. 6.

¹⁷ This proposal is described in more detail in the Ericsson comments at p. 32ff.

With regard to the source of the required new spectrum for public safety communications, we observe that most parties have concentrated their attention on the potential reallocation of the spectrum now set aside for UHF television channels. In the Sixth Notice of Proposed Rulemaking in MM Docket No. 87-28, the Digital Television ("DTV") proceeding, the Commission proposed a plan whereby, at the end of a transition period, all television broadcasting would be confined to a core set of channels that would allow the eventual recovery and reallocation of spectrum now occupied by television channels 2-4, 5-6, and 52-69. One of the intriguing things about the Commission's proposal is that it could allow the immediate reallocation to public safety of a portion of the spectrum now used for UHF television channels 60-69. Ericsson was an early supporter of the idea of reallocating a portion of UHF television channels to public safety use.¹⁸

More recently, we filed comments in response to the Commission's DTV proceeding.¹⁹ In those comments, we expressed our support for the core channel concept. While Ericsson feels that the core area concept is excellent, we took note of the previously referenced Powell comments in this proceeding, and suggested specific modifications of the core channel concept that would make it even more valuable from a public interest perspective.

III. ISSUES RELATING TO INTEROPERABILITY

Based on review of the pleadings in this proceeding, we note the overwhelming agreement among the commenting parties of the importance of interoperability. We also note agreement that

¹⁸ See letter from Dennis C. Connors, Vice President, Global Product Development and Operations, Ericsson Inc., Private Radio Systems to The Honorable Reed Hundt, Chairman, Federal Communications Commission, dated July 12, 1996.

¹⁹ Comments of Ericsson Inc. in Sixth Further Notice of Proposed Rulemaking in MM Docket No. 87-268 dated November 22, 1996.

the option of relocating all public safety communications to a new band is neither feasible nor desirable, and agreement with a point stressed in our comments that there is no single solution that will solve the inter-agency interoperability problem for the public safety community. For example, Motorola states that "There is no single solution to interoperability problems..."²⁰ and NASTD comments that "...we do not believe that there is a readily available single solution to the interoperability problem."²¹ As the PSWAC process revealed so clearly, one of the most significant problems hindering interoperability is the diversity of radio spectrum on which public safety agencies operate. Ten different bands are used for tactical mobile communications by federal, state, and local agencies and no single radio is capable of operating in all of these bands. There is nothing in the comments in the instant proceeding that suggests anything different and, it must be noted, neither the APCO Project 25 process nor the Phase I APCO Project 25 Specification address the cross-band interoperability issue, and therefore will do nothing to reduce this problem.

Although there is some disagreement over the details, there appears to be general support for the option of implementing interoperability at a minimum level within current public safety bands while creating a new interoperability band between 138 MHz and 512 MHz. There is also support for the choice of 25 kHz analog FM (with a later shift to 12.5 kHz FM) as the initial common mode of operation on those channels. Powell, for example, states "I support the Interoperability Subcommittee recommendation adopted by the PSWAC Steering Committee

²⁰ Comments of Motorola, Inc. ("Motorola") dated October 21, 1996 at p. 8.

²¹ Comments of the National Association of State Telecommunications Directors ("NASTD") dated October 21, 1996 at p. 13.

which defines an immediate analog baseline of 25 kHz, with a mandatory migration to 12.5 kHz on January 1, 2005.”²² The State of Ohio suggests that “...analog FM be the emission of choice for any designated common [interoperability] channels.”²³ Mesa argues as follows:

...when such spectrum is allocated for interoperability, a baseline technology must be required. This baseline technology should be at least as spectrally efficient as FCC rules require within the greater band, and they should be open standards. Initially, our suggestion is FM in a channel bandwidth consistent with the band channelization that is used.²⁴

In our comments, we presented a number of strong arguments in favor of choosing 25 kHz analog FM for the baseline or common mode of operation. Because of the importance of this issue, we will briefly summarize those advantages here. The advantages include (1) being backward compatible with the vast majority of the embedded base of public safety radio equipment, (2) being a well understood technology with widely available components, (3) being unencumbered with Intellectual Property Rights issues, (4) exhibiting a high degree of tolerance to co-channel interference which facilitates on-scene, unit-to-unit, infrastructure independent communications, and (5) facilitating infrastructure dependent interoperability through gateways.

With regard to the final point regarding gateways, we observe that the delay and possible signal degradation created by digital transcoding provide additional support for the choice of FM modulation as the interoperability baseline. Changing a signal encoded by one specific narrowband voice coder to the format used by a second voice coder normally creates a processing

²² Powell Comments at p. 14.

²³ State of Ohio Comments at para. 41.

²⁴ Mesa Comments at p. 4.

delay and slightly degrades speech quality.²⁵ While this problem is not insurmountable, it is real. Thus, transmissions using a digital baseline standard would suffer such delays and degradations whenever they passed through a gateway to a radio system using a different digital voice coding system. Given that progress in voice coding is expected to continue and that improved voice coders are expected to be widely deployed in public safety land mobile radio systems over the next decade, use of a digital baseline technology would ensure that either (1) all interoperability gateways would degrade performance or that (2) the digital baseline technology would need to be changed frequently -- an expensive and impractical step.²⁶ In contrast, a signal from an analog FM channel can be digitally encoded without a similar delay. Thus, analog FM is a more universal baseline technology.

In Section IV below, we will delve more deeply into the pro-competitive benefits of choosing 25 kHz FM as the common mode of operation and the problems associated with choosing the APCO Project 25 specification as the future digital baseline strategy. Opposition to Ericsson's support for choosing 25 kHz FM as the common mode of operation comes principally from the APCO Project 25 Steering Committee and those who have affirmatively endorsed the APCO Project 25 Steering Committee comments in this proceeding. Frankly, we are somewhat

²⁵ See the Final Report of the Public Safety Wireless Advisory Committee ("PSWAC Final Report"), September 11, 1996, at p. 276, for a discussion of the digital transcoding problem. This discussion may also be found in para. 8.5 at p. 78 of the Technology Subcommittee Final Report included as Appendix B to the PSWAC Final Report.

²⁶ See the PSWAC Final Report, pp. 34ff. The PSWAC spectrum demand model is based upon a vocoder that is twice as efficient as that used in the APCO Project 25 specification. That is, PSWAC presumed that the vast majority of public safety radios in 2005 would not be using APCO Project 25 voice coding. See, particularly, the PSWAC Final Report, p. 57, footnote 19.

mystified by their opposition in this particular area. After attacking the proposal to have the Commission officially designate analog FM as the baseline interoperability standard, the APCO Project 25 Steering Committee goes on to state the following with regard to the establishment of such a standard:

...they should be consistent with what we believe are PSWAC recommendations, consistent with FCC rules and proposal to use the 25 khz analog FM for existing equipment and a new narrowband 12.5 khz baseline for all new equipment. In addition, there must be recognition of advancing technology and the option of creating a new base line standard for digital equipment.²⁷

The PSWAC Interoperability Subcommittee unanimously recommended that the minimum baseline technology for interoperability be 25 kHz analog FM unless FCC and/or NTIA regulations specify a different emission in a specific operational band.²⁸ Our support for the use of 25 kHz analog FM for the common mode of operation is certainly consistent with that, and it is certainly consistent with the Commission's rules and proposal to use 25 kHz analog FM for existing equipment and new 12.5 kHz equipment.²⁹ And, in the summary and full text of our comments, we agreed that there was a need to examine a baseline interoperability requirement in the evolving digital environment. Our concern as we expressed it therein is only about the

²⁷ Comments of the APCO Project 25 Steering Committee dated October 21, 1996 at p. 8.

²⁸ PSWAC Final Report at p. 52, para. 4.3.27.5.

²⁹ We are mystified -- indeed troubled -- by the comments of a few parties that characterize the potential adoption of 25 kHz analog FM as the minimum baseline technology for interoperability as the "Ericsson proposal." Nothing could be further from the truth. The proposal was the unanimous consensus of the PSWAC Interoperability Subcommittee. See PSWAC Final Report at p. 370. This may also be found at p. 82 of the Interoperability Subcommittee Final Report which was attached to the PSWAC Final Report as Appendix C.

possible anti-competitive consequences if the *process* of establishing the resulting baseline technology is not properly designed.

As best as we can discern it, the APCO Project 25 Steering Committee's objection to our support for 25 kHz analog FM (evolving to 12.5 kHz) relates to the supposed spectrum inefficiency of the technology. We have three comments in response:

First, as we noted, 25 kHz analog FM technology exhibits a high degree of tolerance to co-channel interference which facilitates on-scene, unit-to-unit, infrastructure independent communications. This high degree of tolerance to co-channel interference means that for critical on-scene, unit-to-unit communications, analog FM technology can be very spectrum efficient because of the inherent frequency reuse that is possible with robust (wideband) modulation techniques.

Second, we support the evolution to 12.5 kHz analog FM and thus, in terms of the number of channels that could be assigned at a given location, the spectrum efficiency would improve on the interoperability channels over time.

Third, and more fundamentally, we note that we are primarily addressing the 2.5 MHz of spectrum the PSWAC and many parties have advocated be set aside for interoperability purposes. This amount of spectrum pales when compared with the total of nearly 120 MHz of spectrum that will be dedicated to state and local public safety wireless communications if the Commission adopts the PSWAC recommendations.³⁰ *This means that even small percentage improvements in*

³⁰ The total is composed of the 23.2 MHz of current spectrum plus the 95 MHz of new spectrum (exclusive of the interoperability spectrum) recommended in the PSWAC Final Report.

the operational (i.e., non-interoperability) spectrum would more than compensate for any loss of efficiency in the interoperability band(s). Ericsson is confident that, by encouraging competition and providing proper incentives for the introduction of more spectrum efficient technologies as described in our comments and in these reply comments, manufacturers will deliver large increases, not small increases, in spectrum efficiency.

For the above reasons, we continue to recommend strongly that the Commission establish 25 kHz analog FM as the common mode of communications on the interoperability channels. Moreover, as a practical matter, if the Commission, at the urging of others, elects to embark on a proceeding to choose a digital standard to meet the baseline interoperability requirement, it is almost certain to be a long and difficult process because of the number of competing digital systems identified during the PSWAC process and the complex performance and other technical tradeoffs involved in choosing among them. In contrast, the choice of 25 kHz analog FM presents none of these difficult and contentious issues and has significant pro-competitive benefits as well. The pro-competitive benefits of such rules are recognized by many other parties as we elaborate on in the section which follows.

IV. ISSUES RELATING TO COMPETITION

A. Benefits of Competition and Technological Choice

In our comments in the first round of this proceeding, we emphasized that competition was not only important to ensure that public safety networks cost less and offer more advanced features and functions, but also is essential to allow Ericsson and other manufacturers to develop and market even more spectrum efficient public safety systems. Given the passage of the

Telecommunications Act of 1996 and its emphasis on relying on competition in all parts of the telecommunications marketplace, we find little need to justify our stance in that regard. We would note, however, that there is solid support for the benefits of competition in the comments that were filed in the proceeding. APCO, for example, states that "Competition leads to greater choices and lower costs for agencies and taxpayers."³¹

As a strong proponent of greater choices for public safety agencies, we are pleased to note that many parties recognize that the different technologies identified by the Commission in its Notice -- namely TDMA, FDMA, CDMA, and ACSSB -- have their potential place in public safety wireless communications. For example, AASHTO observes that "While the four modulation technologies listed -- TDMA, FDMA, CDMA, and Narrowband -- offer improvements in spectrum efficiency, each method differs in various areas and no single technology is best for all systems due to the uniqueness of these systems."³² Similarly, Orange County states that "The County believes that there will be valid Public Safety applications for each of the technologies cited in this Docket: TDMA, CDMA, FDMA, and ACSSB (or linear modulation), each with its own advantages and disadvantages for any particular technology application."³³ APCO, having reviewed the various technologies, concludes "Thus, each particular technology has its own advantages and disadvantages. In any given application, some

³¹ APCO Comments at p. 28.

³² AASHTO Comments at p. 11.

³³ Comments of the County of Orange, California ("Orange County") dated October 9, 1996 at p. 2.

will fit better than others.”³⁴ Likewise, Powell notes that “Each of these technologies has its own particular application...Some are better than others for certain uses.”³⁵

As a proponent of TDMA, as opposed to FDMA as chosen by the APCO Project 25, Ericsson is pleased to note that even participants and advocates of the Phase I APCO Project 25 specification concede that TDMA has a role to play. For example, the State of California states that:

We have been an active participant in the APCO Project 25 process and believe its FDMA approach has the widest applicability to public safety systems. However, we also see certain applications in which the 2-slot F-TDMA approach proposed by Ericsson, Inc. may be advantageous.³⁶

Mesa, in examining the applicability of different technologies, notes that systems in areas with very dense user populations “will probably use TDMA.”³⁷ Finally, the most vocal proponent of FDMA, the APCO Project 25 Steering Committee, states that it “...does not oppose the use of TDMA or other relatively wide band technologies. In fact we strongly support their use when one of these technologies will best resolve an individual public safety user’s needs.”³⁸

Based on our review of the APCO Project 25 Steering Committee, Mesa, Powell, and other comments, it appears to us that there is a belief that, while TDMA may present advantages

³⁴ APCO Comments at p. 15.

³⁵ Powell Comments at p. 16.

³⁶ Comments of the State of California, Department of General Services, Telecommunications Division (“State of California”) dated October 18, 1996, at p. 14.

³⁷ Mesa Comments at p. 10.

³⁸ APCO Project 25 Steering Committee Comments at p. 18.

to larger agencies (or collections of agencies sharing a large system) in densely populated urban areas, FDMA may present advantages to smaller agencies in less densely populated areas.

Ericsson believes that its F-TDMA technology presents significant advantages even to smaller/rural agencies. But, even assuming, for the sake of the argument, that their belief is true, we observe that *spectrum congestion occurs almost exclusively in large urban areas*. Therefore, it is not in the public interest to allow rural concerns to dictate technological choices in congested urban areas -- and vice versa.

This leads us to emphasize in the strongest possible terms that, despite some allegations to the contrary, Ericsson's sole purpose in entering this debate is to ensure that it has the opportunity to offer what it believes is a technically superior, more spectrum efficient product into the marketplace. In short, we are more than willing to compete head-to-head with systems based on the Phase I APCO Project 25 specification, the TETRA standards, or any other technology. If our technology turns out to be the best in urban areas and someone else's turns out to be the best in rural areas, so be it. As long as all manufacturers have a fair opportunity to participate in agency procurements, we are more than willing -- indeed, we are anxious -- to take our chances in the marketplace.

B. Competitive Concerns

With regard to having the opportunity to participate in agency procurements, we have two concerns. First, we have concerns when conformance with the Phase I APCO Project 25 or any other technological specification is made a condition of a particular procurement. Second, we have concerns about recommendations by some parties that the APCO Project 25 specification be

selected as the baseline interoperability standard in the evolving digital environment. Both of these concerns stem, in turn, from our problems with the structure and performance of the public safety radio systems/equipment market. In responding to the Commission's statement that a "contributing factor to the deficiencies in today's public safety communications is the lack of a vigorous competitive market for the purchase of communications equipment and services employed by public safety agencies,"³⁹ the APCO Project 25 Steering Committee, in its comments, attacked the Commission's reliance on a report prepared by Hatfield Associates, Inc. ("HAI"). That report, which, among other things, dealt with the structure and performance of the public safety dispatch equipment market, concluded that the market for public safety dispatch equipment is highly concentrated in economic terms as measured by the Herfindahl-Hirschman Index ("HHI").

As a participant in that public safety systems/equipment market, Ericsson is generally aware of the market shares of the different participants and conveyed that information to HAI. It is interesting to note, that, while the APCO Project 25 Steering Committee attacked the Commission's use of the results of the HAI study as somehow contaminated by the use of information supplied by Ericsson, it did not provide any refutation whatsoever to the proposition that the market is highly concentrated.⁴⁰ Moreover, Motorola, the dominant supplier in this highly

³⁹ Notice at para. 95.

⁴⁰ APCO, of course, would have been in an ideal position to develop such market information as it could have done so by employing a statistically valid sampling of its members to determine volumes of purchases from various vendors. Because, in the vast majority of the cases its members are public agencies, there would be little problem with APCO assembling the information from publicly available sources.

concentrated market, was totally silent on the issue of market concentration in its comments. Because of their dominance, they would be in an even better position than Ericsson to refute the conclusion of the HAI study relating to market concentration. Therefore, the conclusion we draw is that there is certainly a lack of a vigorous competitive market for the purchase of communications equipment and services employed by public safety agencies just as the Commission surmised in its Notice.⁴¹

Instead of trying to refute the irrefutable, the APCO Project 25 Steering Committee, APCO, Powell and others pointed to the entry of potential new competitors into the market for systems/equipment utilizing Phase I APCO 25 Project specification. While we welcome the entry of these new competitors into the market, the fact of the matter is that these firms, alleged by APCO to include Daniel's Electronics, BK Radio, Garmin International, Stanilite, Transcript International, and E.F. Johnson,⁴² are small firms unlikely to have the depth of experience and financial resources to loosen the grip of the dominant supplier in this market.⁴³

⁴¹ Public safety agencies would be less dependent on suppliers of public safety dispatch systems/equipment if they could purchase equivalent services from commercial service providers. However, as shown throughout the comments, the public safety user community argues strongly that they cannot rely on commercial services for their critical radio dispatch and related needs.

⁴² APCO Project 25 Steering Committee Comments at p. 29.

⁴³ In separately filed reply comments in this proceeding, Strategic Policy Research, Inc. ("SPRI") presents strong evidence supporting the judgment that these small firms lack the experience and financial resources to compete vigorously in the public safety systems/equipment market. It also concludes that the APCO Project 25 specification "has impeded rather than facilitated the entry of new, major suppliers into the public safety land mobile radio market."

In short, despite its stated purpose of ensuring or promoting competitive procurement, the establishment of the Phase I APCO Project 25 specification has patently failed to attract any substantial new players into the public safety dispatch systems/equipment market. Moreover, we suspect that even the supposed new entrants may be highly dependent on the dominant manufacturer for devices such as chip sets, access to Intellectual Property Rights outside the scope of the Memorandum of Understanding signed by Motorola, and critical technical advice and assistance.⁴⁴ Thus the ability of these small firms to mount an independent, serious assault on the dominant supplier whose basic technology was chosen as the basis for the APCO Project 25 specification is highly questionable. That would not have been the case if larger firms such as AT&T (now Lucent), NEC, Hughes Network Systems, Nokia, Qualcomm, NorTel, Philips, Alcatel, or Matra had chosen to build such systems/equipment.

The failure of the APCO 25 Project process was dramatically illustrated by the following trade press report:

Because of Motorola's stranglehold on the U.S. public safety market through the recently adopted APCO 25 standard, Nokia has made the business decision to stay out of the U.S. private radio market as a whole.⁴⁵ (Emphasis added.)

As stated in the Comments of the Association of Federal Communications Consulting Engineers, "The finest technology in the world is not helpful if it is prevented from emerging by monopolistic market forces."⁴⁶ We couldn't have said it better.

⁴⁴ For example, SPRI, in its reply comments, concludes that Transcript is not in the APCO Project 25 equipment business as a manufacturer or designer as those terms are normally used, but rather as "a reseller of Motorola radio equipment."

⁴⁵ "Nokia Won't Enter the U.S. SMR Market," Land Mobile Radio News, October 13, 1995, at p. 7.